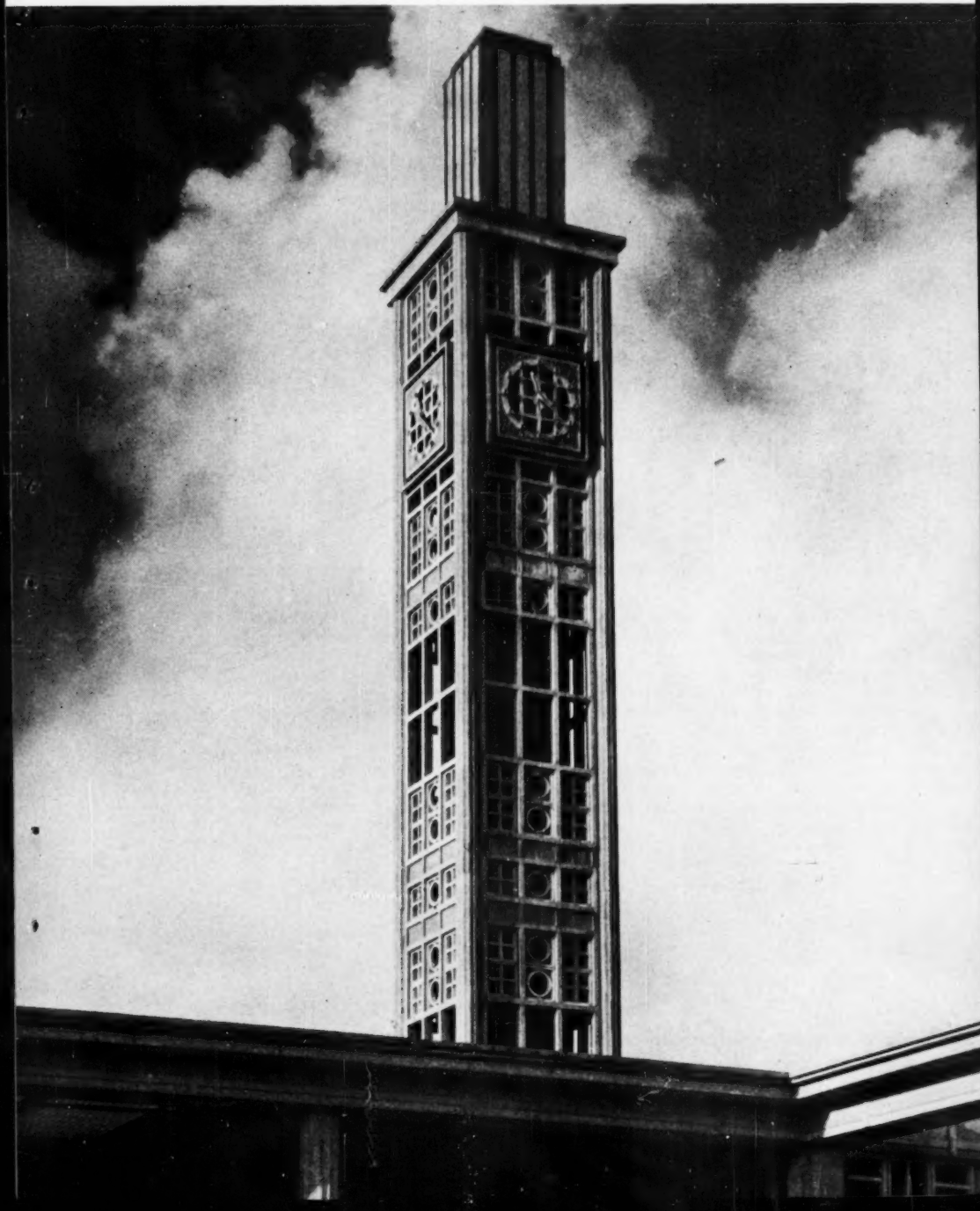
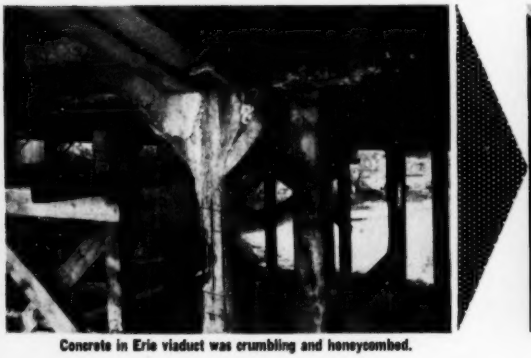
ACI News Letter

Vol. 25, No. 9 JOURNAL of the AMERICAN CONCRETE INSTITUTE May 1954



ERIE'S CONDEMNED VIADUCT RESTORED IN RECORD TIME WITH $75,000 SAVINGS



Concrete in Erie viaduct was crumbling and honeycombed.

After Prepakt repairs, Erie has stronger-than-new structure.

● The West 6th Street Viaduct had always been a "headache" for the city of Erie (Pa.). Soon after completion in 1925, it required shoring up. By 1952 rapid deterioration of concrete structural members caused it to be closed to traffic.

With cracked, honeycombed columns and a badly disintegrated deck, it was near collapse. Rebuilding, although costly, seemed the only solution until Intrusion-Prepakt suggested a rehabilitation plan using its fast, low-cost method.

Prepakt was awarded the contract and started work to meet a 100-day deadline. All porous, disintegrated concrete was removed by chipping. Then, members were restored to original size with Prepakt Concrete made by (1) forming members, (2) filling forms with coarse aggregate and (3) intruding this aggregate with special Intrusion mortar. Prepakt Concrete does not shrink during setting and has a very high permanent bond strength, making it ideal for repair work.

To make the bridge *stronger than new* (from H-12 to H-20), a new Prepakt Concrete girder beam was added on the longitudinal centerline. This beam and its columns are supported by cast-in-place Prepakt Concrete piles.

Erie's bridge was reopened *28 days ahead of schedule*—some five months earlier and $75,000 cheaper than with any other method.

Once again Prepakt lived up to its claim: "If it's still standing, we can repair it"!

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Consulting Engineer: Joseph G. Conrath

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ACI

News Letter Contents

May 1954

On the Cover—Clock tower of the railway station at Enschede, Netherlands. Architect—H. G. J. Schelling. —*Courtesy Cement (Amsterdam)*

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HOW ACI DID IN '53

A year ago (May 1953 *News Letter*) the finances of the Institute were reviewed for the information of members. With the audit of 1953 now completed, it is timely to again discuss how your Institute is doing financially and organization-wise and take a brief look at future plans. Highly important to continued progress of ACI are, of course, the trends of its membership and its finances.

Assets of the Institute as of December 31, 1953, were $140,350 with liabilities, including accounts payable and reserves, of $15,688, leaving a general fund surplus of $124,662 amounting to 71.9 percent of the 1954 operating budget. Thus the general fund surplus is nearing the initial Board of Direction aim of one year's operating expenses. Other reserves include the retirement fund, $35,452, Turner trust fund, $2628, and the Alfred E. Lindau trust fund, $4194.

Sources of 1953 income of $177,929 (almost identical with the $178,238 in 1952) are shown in Fig. 1. Compared to 1952, the proportion contributed by member dues increased by 3.4 percent, while publication sales amounted to 34.5 percent compared to 38 percent the previous year. Revenue

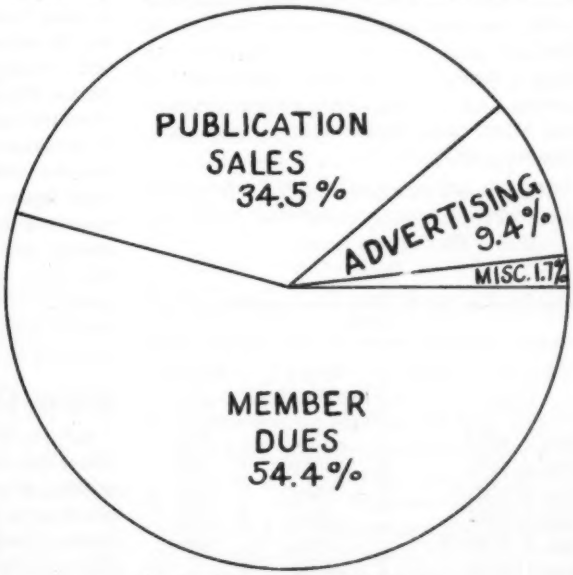

Fig. 1—Sources of 1953 income

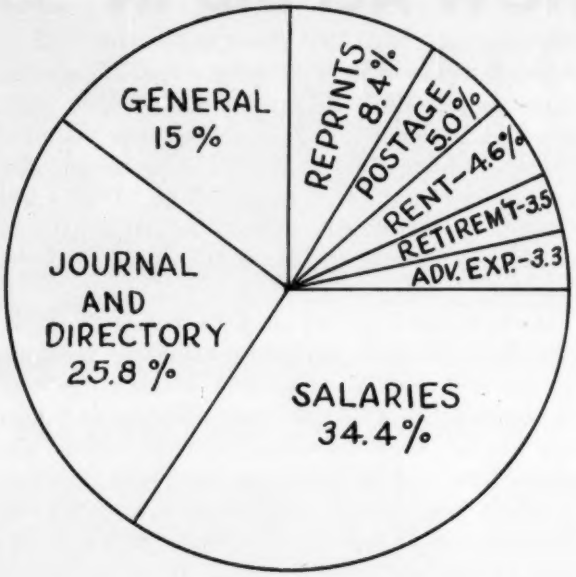

Fig. 2—ACI expenses, 1953—Percent of total

from advertising was relatively static showing only a fractional decline.

Expenses for 1953, which amounted to 80.2 percent of income are broken down into principal items in Fig. 2. Staff increase in 1953, raised the salary item 3.4 percent over 1952. Increased printing cost and the biennial *Directory* raised the cost of publications including bound volumes and reprints by 1.2 percent. At the same time, general expenses and other minor items declined percentagewise from 1952.

Membership continued its slow but healthy gain. The following tabulation shows the trends over the last five years:

Membership trend—Five years ending Jan. 1, 1954

Date	Total membership	Annual gain
Jan. 1, 1954	6352	380
Jan. 1, 1953	5972	462
Jan. 1, 1952	5510	295
Jan. 1, 1951	5215	371
Jan. 1, 1950	4844	449
Jan. 1, 1949	4395	

Individual member efforts, always the most productive of new ACI members, continued to lead all other methods of procuring new members. Other effective sources were requests for information and publications prospects, the splendid work of the Denver Convention Committee which so far has brought in 122 new members, JOURNAL applications, and nominations by members. The nomination form first used last year provided a selective list of member prospects, in that approximately 20 percent of those nominated became members. This same method was used again in 1954 with the mailing of the standards ballot. The number of names received has been gratifying and it is hoped that last year's experience with this as a productive "member-getter" will be repeated when the nominees are approached in the near future.

Plans for '54

At its February meeting, the Board of Direction adopted a 1954 budget approximately $31,000 higher than the 1953 expenditures. This arises from previous Board action, announced by retiring President Henry L. Kennedy (ACI JOURNAL, Apr. 1954, p. 617) to provide greater service to ACI

members and the engineering profession in general through addition of a technical director to the ACI staff, and because of increased expenses and anticipated special publications. Other increases are in JOURNAL budget and in cost of reprints.

Receipts for the year are estimated to be little changed from 1953 with the percentages from various sources remaining about the same. With the increased expenses, expectations are that the surplus for the year will be small. However, services to members are expected to be materially increased if the new position can be filled early in the year.

Symposium on nondestructive testing of concrete

The International Union of Testing and Research Laboratories for Materials and Structures (RILEM) recently held an international symposium in Paris, France, on nondestructive testing of concrete which was attended by 140 delegates from 22 countries. Honorary chairmen were Prof. Inge Lyse, president of RILEM, and L. Stahl, director, Laboratoire Central des Ponts et Chaussées, and president, Assn. Francaise de Recherches et d'Essais sur les Matériaux et les Constructions.

The program included papers and discussions on sonic tests, superficial hardness tests and comparison with sonic tests, examination by γ-rays and neutrons, and possibilities of control of placed concrete by nondestructive methods. Sonic tests included measuring apparatus—scope of application and precision; quality control and detection of defects, reinforced concrete control, and investigation of corrosion and frost effects; and sonic measurements for evaluating mechanical properties, modulus of elasticity, and strength.

Interest in this field is attested to by the fact that some 40 papers were presented at the sessions. In addition, information was sent in by others who could not attend the symposium. Proceedings of the symposium are to be published in RILEM *Bulletins* and then in a special volume. These will be abstracted in the "Current Reviews" section of the JOURNAL as they become available.

Frank E. Richart award

Directors of the American Society for Testing Materials recently announced establishment of the Frank E. Richart Award, made possible through the interest of his family.

An honorary member of ACI and ASTM, past president of ACI, chairman of ASTM Committee C-9 on Concrete and Concrete Aggregates, and senior vice-president of ASTM were a few of the positions held by Mr. Richart before his death in 1951.

Considering the nature of his work, it is natural that the award should be given for outstanding technical investigations in the field covered by ASTM Committee C-9. The award, consisting of a suitably engrossed certificate and an honorarium, the amount of which is to be decided, will be presented not oftener than every three years. The committee that will make the selection for the first award includes H. J. Gilkey, chairman, L. W. Teller, and K. B. Woods.

Looking ahead to 1955

With the successful completion of the 1954 convention in Denver, ACI's Technical Activities Committee is already looking toward the 1955 meeting in Milwaukee and planning the program.

All those who have in mind offering papers for presentation at the 51st annual meeting should write to Institute headquarters no later than July 1, furnishing a synopsis which should make clear the intended scope of the paper and indicate features that, in the opinion of the author, will justify its inclusion in the program. Contributors should be prepared to have first drafts of manuscripts in the hands of the Technical Activities Committee for appraisal and acceptance by Sept. 15, 1954, and final manuscripts by Jan. 1, 1955.

From the replies received and suggestions from other sources, TAC will select the papers to make up each convention session. Write Institute headquarters about that contribution *you* believe merits a place on the program.

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Positions and Projects — ACI Members

Swanson promoted

Harry T. Swanson was recently named manager of the Atlas White Cement Bureau of Universal Atlas Cement Co., New York, N. Y. Mr. Swanson, a native of Two Harbors, Mich., completed his early education in that city and served with the U. S. Army in Europe during World War II before obtaining his degree in aeronautical engineering from the University of Minnesota in 1948. In the same year, he joined Universal Atlas at New York as a trainee in the Technical Service Bureau and, in 1950, as a full-fledged technical service engineer, was assigned to field duty with headquarters at Philadelphia, Pa. He held this position until his present promotion.

Rensaa honored by Canadian award

E. M. Rensaa, of Main, Rensaa & Minsos, Edmonton, Alberta, Canada, was recently awarded the Gzowski Medal for his paper "The Cracking Problem in Reinforced Concrete Buildings." The medal is presented annually by the Engineering Institute of Canada for the best paper on civil engineering.

Solite sponsors awards

Three Virginia Tech seniors in architecture have received top honors in the first event of Southern Lightweight Aggregate Corp.'s class competition for the design of a church. Winners were: Byron Black, Roanoke, Va., first place, $250; Leroy Beach, Falls Church, Va., second place, $150; and Charles Zimmerman, Jr., Harrisburg, Pa., third place, $100. Also eligible to compete for cash prizes, totaling $1500, are fourth year architecture students at the University of Virginia. These awards, sponsored by Southern Lightweight Aggregate Corp., Richmond, Va., manufacturers of Solite lightweight aggregate, are being administered by the Virginia Chapter, American Institute of Architects.

Each spring, as a regular part of their studies, students in Virginia's two schools of architecture will be assigned a Solite award problem. In addition to receiving award money the winners in the competition receive an expense-free trip to the spring meeting of the Virginia Chapter, AIA, where they receive their awards. Second and third place winners in the two schools receive $150 and $100 each, respectively.

Woods heads C. E. department

Prof. Ralph B. Wiley, head of the School of Civil Engineering and Engineering Mechanics, Purdue University, Lafayette, Ind., and director of the Joint Highway Research Project, will retire June 30 to be succeeded by Kenneth B. Woods, professor of highway engineering and associate director of the Joint Highway Research Project, a cooperative research program administered by the university in cooperation with the Indiana State Highway Department.

Kenneth B. Woods

Professor Woods is a nationally known authority in the field of highway engineering for his work in connection with the highway research project, the first of its kind in the nation, which has served as a model for similar projects in more than 15 other states. In addition to his teaching and research at Purdue, Professor Woods has contributed to the educational research programs for U. S. Army and Air Force engineers in air photo interpretation and permafrost studies of vital importance to military operations in the northern areas of Alaska, northern Canada, and Labrador.

He has also made many contributions to highway design and technology, airport construction, and highway traffic problems. He received the 1945 Highway Research Board Award of the National Research Council for a paper of outstanding merit, and in 1949 he received the Distinguished Service Award from the same agency. Currently he is a member of ACI, the board of directors of the American Society for Testing Materials, and the executive committee of the Highway Research Board.

ACI 1954 regional meeting progress report

Local committees appointed to handle the program of the ACI regional meeting to be held at the Statler Hotel in Los Angeles, Calif., Oct. 28 and 29, 1954, report that their plans are rapidly shaping up and soon will be released in detail. Indications are that the agenda will provide ACI members and their guests with new ideas and stimulating discussions of progress in the field of concrete.

The technical program, in charge of J. L. Peterson, J. L. Peterson, Inc., Los Angeles, with Ralph W. Spencer, Southern California Edison Co., Los Angeles, acting as advisor, will be balanced as to subject matter. This part of the program will draw on common uses of concrete, special uses, development, design, and research. The committee intends to provide time for discussions of papers presented and of subjects of particular current interest.

Suitable entertainment in the form of social functions at the Statler and divertisement elsewhere is being arranged by C. D. Wailes, Jr., C. D. Wailes Corp., Los Angeles, chairman of the entertainment committee. For those who are interested, inspection trips to jobs in progress will be arranged by Robert G. Swan, general contractor, Los Angeles.

Ernst Maag, Department of Public Works, California, chairman of the registration and information committee, is working out these details and, in due time, particulars will be mailed or otherwise announced to all members. Heading other committees and reporting progress are F. Thomas Collins, consulting engineer, San Gabriel, membership promotion; H. G. Feraud, finance, and C. V. Armour, University of Southern California, Los Angeles, educational contacts. Chairman of the publicity committee is John K. Minasian, structural engineer, Pasadena, with Dr. Vernon P. Jensen, C. F. Braun & Co., Alhambra, as advisor and Harold K. Hensley assisting on press relations.

General committee chairman in charge of the Los Angeles meeting is Samuel Hobbs of the Portland Cement Assn. He is assisted by Lewis K. Osborn, Kistner, Wright & Wright, Los Angeles, secretary; Byron P. Weintz, Consolidated Rock Products Co., Los Angeles, treasurer; and Dr. Jensen and Mr. Spencer, present and past members, respectively, of the Institute's Board of Direction.

ACI to publish bibliography on prestressed concrete

ACI-ASCE Joint Committee 323, Prestressed Concrete, has compiled a bibliography on prestressed concrete containing approximately 2000 references, 1896–1953, including patents.

The Institute is planning to publish this bibliography later this year at a price of about $2 per copy. To aid ACI headquarters in determining the quantity needed, if you want a copy for your library, please fill out the coupon below and mail to ACI headquarters in Detroit.

American Concrete Institute
18263 W. McNichols Rd., Detroit 19, Mich.

Date.....

Yes, I want a copy of the ACI-ASCE Committee 323 "Bibliography on Prestressed Concrete," at a price of about $2 per copy.

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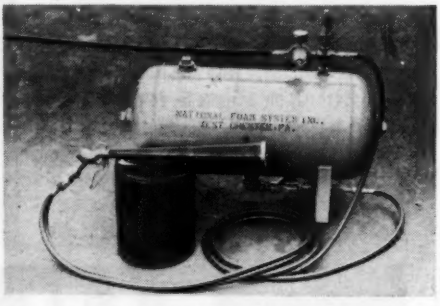

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Magnel discusses U. S. prestressing

Prof. Gustave Magnel, University of Ghent, Ghent, Belgium, international authority on prestressed concrete, discussed United States techniques at a recent meeting of the Concrete Industry Board of New York City. He emphasized that prestressed construction demands quality concrete.

Architectural and construction industries center

Plans for an architectural, engineering, and construction industries "center," to be erected in Miami, Fla., next year, have been announced by Clinton T. Wetzel, president of the Architect's Samples Bureau, Miami. It will be known as Du Pont Plaza Architectural and Construction Industries Center. The project will cost an initial $5,000,000 to erect and will represent an investment of over $10,000,000 when completed.

In a central location in the proposed Du Pont Plaza Center, 75,000 sq ft of floor area will be devoted to permanent, graphic displays of products devised and manufactured by the building materials industries. Policy and operation of the architect's samples exhibits will be conducted with the assistance of a technical and professional advisory committee selected from allied architectural, engineering, and construction industries.

Agenda approved for Sixth Pan American Highway Congress

An agenda for the Sixth Pan American Highway Congress to convene in Caracas, Venezuela, July 11-21, has been approved by the Economic Council of the Organization of the American States. The organizing committee for the meeting is headed by Dr. Julio Bacalao-Lara, Venezuelan Minister of Public Works, as honorary president, and Dr. Eduardo Arnal, president of the Society of Engineers of Venezuela, as executive secretary.

A delegation representing the organizing committee has visited Peru, Ecuador, Colombia, Panama, Mexico, and the United States and is continuing its good will tour, inviting public works officials to attend the congress.

Charles W. Smith, Smith Engineering and Construction Co., Pensacola, Fla., a member of the executive committee of the American Road Builders' Assn., Pan American Division, and former president of the ARBA Contractors Division, has participated in meetings in Caracas dealing with arrangements for the July conference.

LOOKING AHEAD

May 17-20, 1954—Basic Materials Exposition, International Amphitheater, Chicago, Ill.

May 23-24, 1954—41st Congress, National Rivers and Harbors Congress, Mayflower Hotel, Washington, D. C.

June 13-18, 1954—57th Annual Meeting and 11th Exhibit of Testing and Scientific Apparatus and Laboratory Supplies, and 9th Technical Photographic Exhibit, American Society for Testing Materials, Sherman and Morrison Hotels, Chicago, Ill.

June 14-18, 1954—62nd Annual Meeting, American Society for Engineering Education, University of Illinois, Urbana, Ill.

June 14-19, 1954—Atlantic City Convention, American Society of Civil Engineers, Chalfonte-Haddon Hall, Atlantic City, N. J.

June 15-19, 1954—86th Annual Convention, American Institute of Architects, Statler Hotel, Boston, Mass.

June 20-27, 1954—First International Congress of Precast Concrete, Brussels, Belgium

June 21-23, 1954—Conference on Thin Shells, Massachusetts Institute of Technology, Cambridge, Mass.

July 11-21, 1954—Sixth Pan American Road Congress, American Road Builders' Assn., Pan American Division, in cooperation with the Venezuelan government and Western Hemisphere engineers, Caracas, Venezuela

October 28-29, 1954—Los Angeles Regional Meeting, American Concrete Institute, Statler Hotel, Los Angeles, Calif.

Riverside builds new employee "change house"

A 6500-sq ft structure incorporating several interesting and unusual applications and techniques in concrete construction has been completed at the Riverside Cement Co.'s Oro Grande plant, Victorville, Calif. The $95,000 "change house" building, designed by the Los Angeles architectural firm of Allison and Rible, was built to provide locker, shower, and toilet facilities for plant employees.

Concrete was selected as the basic building material for several reasons. One, of course, was the weather. In addition to the wide variations of temperature, 10 to 125 F, the area's humidity ranges from zero to 5 percent and up. Winds of 100 mph are not uncommon. Because of the extreme heat and dryness, wood construction was deemed unwise. Added to these reasons was the fact that concrete was easily obtainable and economical.

At the same time, it was a matter of pride with the Riverside Cement Co. to actually utilize the various methods by which its product could be used in construction. Four different types of concrete construction went into the building: (1) cast-in-place concrete, (2) precast concrete structural members, (3) stained concrete floors, and (4) concrete block.

Columns, girders, and joists were cast on the ground and lifted into place by cranes. The same procedure was followed with specially textured wall tilt-up panels. Wall columns, 5½ in. deep, were cast after the wall sections were in place, resulting in a homogeneous panel construction about 6½ in. thick. Although these sections may seem thin, additional strength was gained by close control of construction techniques and by the use of steel reinforcement. Walls of the main building are cast concrete panels while walls of the smaller adjoining building are formed of concrete block with alternate 4 and 8 in. thicknesses.

Specially designed lips on the edges of the roof joists supported the forms which permitted casting the diaphragm roof slabs without aid of additional shoring or supports.

Exposed exterior columns were cast into pressed paper forms, while most larger members were cast in wood forms.

Weights of the precast members varied from 1500 lb, the approximate weight of a roof joist 19 ft long, 5½ in. thick, and 14 in. high, to 8 tons, the approximate weight of a 10 x 20-ft, 6 in. thick wall panel.

Accents on the exterior of the building are painted; the columns of the main unit are a turquoise blue-grey, as is the smaller adjoining building. Panels are left in natural concrete color, while overhangs are finished in a peach tone.

The building is windowless, both to protect it from sand and grit and to provide greater control over the interior temperature. It is completely air-conditioned and ventilated and is automatically heated.

Riverside Cement Co.'s Oro Grande employee facility. Architects, Allison and Rible, Los Angeles; general contractors, Steed Bros., Alhambra; structural engineers, Ropp and Ropp of Los Angeles; and Lester Kelly, Los Angeles, mechanical engineer

Kavanagh receives medal

The Architectural League of New York has awarded its 1954 National Gold Medal for creative design work in engineering to Dr. Thomas C. Kavanagh, chairman, Department of Civil Engineering, New York University, New York, N. Y., and Camilo Piccone of Mexico for a bridge spanning the Rio Blanco River near Vera Cruz, Mexico. Mr. Piccone based the structure on a design conception by Dr. Kavanagh.

OCBA elects new officers

The 1954-55 officers of the Ohio Concrete Block Assn., Inc., elected at the first annual convention in Columbus, Ohio, last February are William A. Rodgers, Chillicothe, president, Sam C. Davis, Dayton, first vice-president, O. H. Seeger, Columbus, second vice-president, and T. L. Goudvis, Elyria, treasurer. John F. Royer, Columbus, was re-elected secretary.

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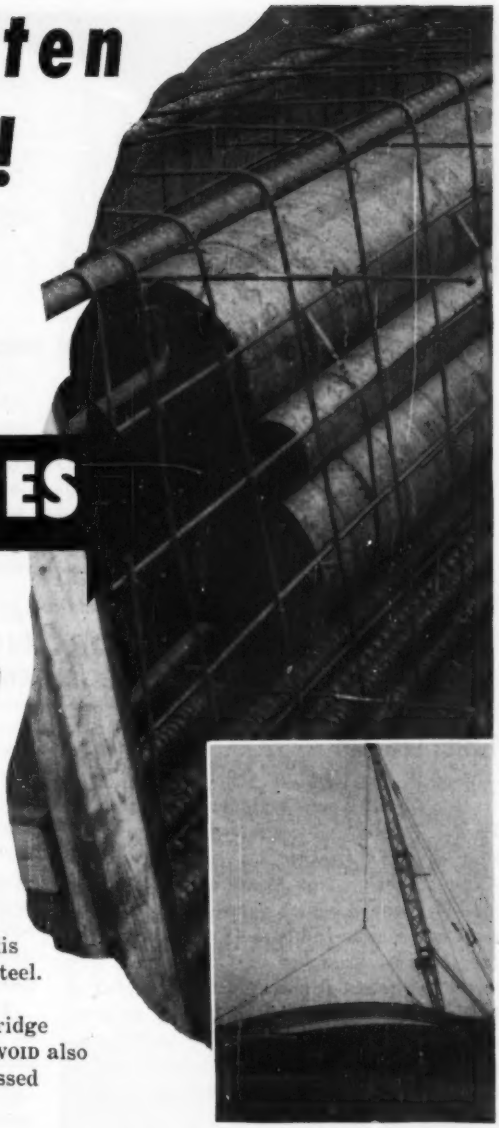

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Twaits honored

Ford J. Twaits, Los Angeles, Calif., contractor for 42 years and chief executive of Ford J. Twaits Co., was honored by presentation of the Construction Industries Sixth Annual Achievement Award at the 19th Annual Gridiron Banquet sponsored recently by the Construction Industries Committee of the Los Angeles Chamber of Commerce. The award is presented annually to a member of the industry on the basis of lifetime achievements in public service, service to the construction industries, public relations, and in the science of design, construction, and materials.

Mr. Twaits is founder and twice president of the Southern California Chapter of Associated General Contractors of America and is a member of Consulting Constructors' Council of America. The evidence of his building accomplishments and one man's permanent stamp on a great city's physical make-up can be seen in such buildings as the Pacific Mutual Building, Pacific Finance Building, Associated Realty Building, Biltmore Hotel, Biltmore Theater, Texaco Building with its United Artists Theater, Barker Brothers Building, Pershing Square Building, Good Samaritan Hospital, Title Insurance & Trust Building, Bank of America, and others dominating the skyline of Los Angeles, all constructed by the Twaits organization. One of Ford Twaits' most recent achievements is the construction of the underground garage in downtown Los Angeles' Pershing Square.

Ford J. Twaits has been active in the field of industrial and commercial construction since 1919. Headed by Ford J. Twaits and Carl H. Wittenberg, partners, the firm is presently engaged in construction of numerous important projects in California including guided missile installations at Point Mugu; Police Administration Building, Los Angeles; warehouse and sales building for Colyear Motor Sales Co., Los Angeles; aircraft maintenance hangar at El Toro Marine Base, Santa Ana; Marine Artillery Training Center, Twentynine Palms; jet test airfield runway, Edwards, and ordnance facilities at Nellis Air Force Base, Las Vegas, Nev.

Port Isabel-Padre Island causeway completed

The first reinforced concrete causeway linking the Texas mainland with the state's largest off-shore island has been completed—Cameron County's $2,225,000 causeway stretching from Port Isabel in Lower Rio Grande Valley across Laguna Madre Bay to Padre Island. Heldenfels Brothers, Corpus Christi, Texas, was the general contractor.

The causeway project called for construction of a 6766-ft reinforced concrete bridge across the bay, with hydraulic fills linking both ends to land. In addition, a swing bridge had to be put in place across the Intracoastal Canal.

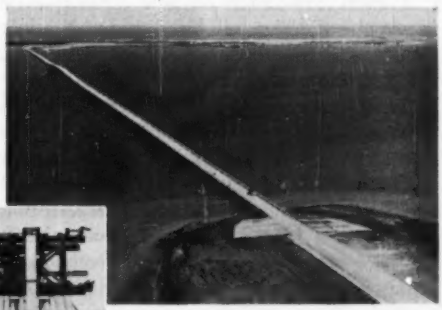
Concrete piling was cast on large piling beds in the construction area along the Port Isabel waterfront. The contractor cast 25 beds—each a 4-in. thick concrete slab large enough to accommodate four piles at a time. Beds were separated by roadways permitting easy access for transit-mix trucks.

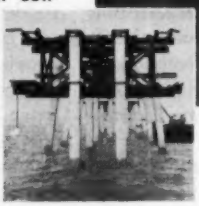
Because of constant salt water exposure, 6-sack cement per cu yd concrete was used in casting the 920 piles required for the causeway. Each was reinforced with eight 1½-in. steel bars, and piles weighed from 12 to 17 tons each. All piles up to 70 ft in length were cast 18 in. square; the longer ones were cast 20 in. square.

Piles were driven in bents of four, 30 ft 8 in. apart except at one point near the center of the bay where a 50-ft long, high span permits most boat traffic to pass beneath the causeway. Pile driving was simplified considerably by a template especially designed for the job and built in the construction area at Port Isabel. The steel template weighed 17 tons and was constructed with openings to hold piles of an entire bent in place at one time, the two outside piles at a batter of 1 to 8 in. At the start, several temporary wood piles were driven near the mainland shore, and the template was fastened over them. Concrete piles were then slipped through the forward openings in the template and driven into place. As each bent was finished, the template was moved forward and the procedure was repeated. Advantages gained using the template were elimination of instrument platforms, speed of operations, and a perfect line on the outside battered piles.

Timbers (4 x 12 in.) supported the template at each bent and as the template was moved along, the timbers stayed to serve as supports for pile cap forms. Pile caps were then cast, followed by the deck slabs of the causeway. Pile cap and slab casting were accomplished with a complete batching plant set up on a work barge.

The barge carried enough sand, gravel, and cement to place 60 cu yd of concrete each trip; 49 cu yd were required to produce a slab complete with cap, rails, and curbs. At the construction peak, nine slabs were being cast every six days. Reinforcing steel for the slabs was fabricated in the construction yard on shore, hauled out by barge, and set in place by crane.





The main bridge of the $2,225,000 Cameron County, Texas, causeway connecting Port Isabel in the Lower Rio Grande Valley with the southern tip of Padre Island. The bridge is 6766 ft long, and the causeway with approaches measures 15,272 ft.

Inset: Template used in construction of the causeway contained slots through which concrete piles were placed and then driven into the floor of Laguna Madre Bay. The template was supported by previously driven piles

Courtesy Heldenfels Brothers

Slab construction involved setting steel forms between bent caps, placing reinforcing steel in the forms, and casting the concrete. The slabs were allowed to cure under mats that were kept soaking wet. Forms were removed from the slabs after the concrete gained at least 500 psi strength which was usually in four days. At 7 days, a concrete strength of 625 psi was required, and, after 28 days, a strength of 4000 psi was specified. Actually, strengths usually were considerably greater than those minimum requirements, running, respectively, about 700 and 4800 psi.

To avoid slowdowns caused by having too many men congregated in the same working area, alternate slabs were cast and then as quickly as was practical, the gaps were filled.

Following completion of the main section of the causeway, seven slabs were constructed to serve as approaches to the swing bridge across the Intracoastal Canal. The swing bridge is a 160 x 32-ft barge with a 6-in. reinforced concrete slab roadway 26 ft wide on its deck.

Concrete hand rail and sheet piling for the entire project were cast and cured on shore and taken to the job. The hand rails numbered 908—four to a slab. A total of 420 pieces of sheet piling were used to protect the embankment ends at both the causeway and the swing bridge. The sheet piling were 2 ft wide, 24 ft long, and 10 in. thick, with interlocking grooves. They were driven 20 ft below the ground surface and topped with 2-ft square concrete caps.

Structural design conference

A short conference on new developments in structural design will be offered at Virginia Polytechnic Institute, Blacksburg, Va., Aug. 4-6, under the sponsorship of the Department of Applied Mechanics. The program will be of direct interest to structural designers and architects and will cover topics embracing the design of structures subjected to impulsive loadings such as those resulting from atomic blasts, the elastic and plastic behavior of the materials and component structural parts, and the elastic and plastic analysis of two- and three-dimensional structures.

Four outstanding engineers will give a series of three lectures each on "Design of Structures for Blast Loading," by Dr. N. M. Newmark, research professor of civil engineering, University of Illinois, Urbana, Ill.; "Plastic or Limited Design of Rigid Frames and Slabs," by Dr. P. S. Symonds, Division of Engineering, Brown University, Providence, R. I.; "Three Dimensional Analysis of Curved Elastic Rings of Rigid Frames with Curved Members," by Dr. James Michalos, Civil Engineering Department, Iowa State College, Ames, Iowa; and "Thermodynamic Effects on Stress Analysis and Plastic Properties of Materials," by Dr. A. Freudenthal, Civil Engineering Department, Columbia University, New York, N. Y.

A registration fee of $20 will be charged for the short course and individuals will be housed in VPI dormitories or local hotels or motels according to their choice. Registration will be limited to 100. Further details may be obtained from Prof. D. H. Pletta, Applied Mechanics Department, Virginia Polytechnic Institute, Blacksburg, Va.

ASTM accepts tentative concrete pipe revisions

The Administrative Committee on Standards of the American Society for Testing Materials recently accepted several new tentative methods and specifications, and tentative revisions of existing standards including a group of tentative revisions on the following four types of concrete pipe: "Specifications for Concrete Sewer Pipe (C 14)," "Reinforced Concrete Sewer Pipe (C 75)," "Reinforced Concrete Culvert Pipe (C 76)," and "Concrete Irrigation Pipe (C 118)."

These changes further improve and refine the requirements and techniques of testing, based on accumulated experience and long use of these well-known and nationally recognized standards.

The revisions include provision for lift holes; the use of drilled cores in place of rodded cylinders; extension of permeability test beyond 15 min and not to exceed 24 hr; provision in the tables for nonreinforced concrete sewer pipe to contain values for extra strength pipe, as well as to recognize the use of tongue-and-groove type; and refinements in the three-edge bearing test procedure.

Westgate shopping center completed

The H. K. Ferguson Co., Cleveland, Ohio, engineers and builders, recently announced that the multimillion dollar Westgate shopping center, Cleveland's first regional center and Ohio's most modern suburban trading development, has been officially opened. The center, located on a 47-acre tract in Fairview Park, a Cleveland suburb, provides more than 380,000 sq ft of floor space for its 43 tenants. A 30-acre parking area can accommodate 4000 cars.

Six of the center's seven buildings are one-story structures. The seventh—and largest—building is a two-story structure with 140,000 sq ft of floor space; 31 precast concrete panels were used for the second-story walls of this building. These 12½ x 15½-ft panels, each 5 in. thick and weighing 12 tons, were raised into position by crane at an average rate of 1 per hr. The two-story building's walls are faced with field stone, while the other buildings have concrete block walls faced with brick veneer; another feature is the sturdy concrete roof slab. Covered with three-ply felt and asphalt, the slab is designed to become the floor of a third story if the structure is ever enlarged.

Multistory structure planned for Alaska

Alaska's next addition to its tallest-building group will be a family housing unit to be constructed under the Alaska defense construction program at the Army port of Whittier.

The multimillion dollar building will be 14 stories tall. It will provide a total of 177 one-, two-, and three-bedroom apartments. The proposal for the construction of the building is presently being announced to contractors by the office of the Alaska District, Corps of Engineers.

The building will be of reinforced concrete construction with inner block walls. The design calls for utilization of the crumble-joint feature utilized in larger type buildings constructed under the Alaskan defense construction program. This method is a practical precaution against earth tremors. Buildings are constructed in completely separate sections and the 8-in. gaps between the sections are joined by accordian-type copper sheeting. Plans for the Whittier housing unit call for two such 8-in. crumble joints.

The Whittier housing unit will be 244 ft long and 96 ft wide. It is to have a full basement, with two elevator-housing penthouses on the roof.

Research projects compiled by Committee 115

In keeping with the assignment of Committee 115 of reviewing and correlating research in plain and reinforced concrete, research sessions are presented at annual conventions, correspondence is carried out among committee members, and an annual compilation of research projects underway at various laboratories is issued. Copies of the 1954 compilation, distributed at the Denver convention, are available from Institute headquarters in Detroit.

From continuing interest of ACI membership in activities of the committee, it is evident that real needs are being satisfied. It would be presumptuous, however, to assume that the committee has reached the zenith of its possible usefulness; there must be various ways in which increased service can be rendered. Your reactions and suggestions in this connection are earnestly requested. Since the committee is anxious to have complete coverage of all research projects in its next compilation, all persons having suggestions or knowing of omissions are urged to initiate correspondence at once. No information will be given any publicity without the permission of the correspondent. Address your suggestions and inquiries to:

Prof. George W. Washa
Secretary, ACI Committee 115
Engineering Building
University of Wisconsin
Madison 6, Wis.

Problems and Practices

Fourth of a series relating to "down-to-earth, everyday" concrete problems. This series, presented in question and answer form, attempts to give brief answers to the more common (and sometimes uncommon, too) questions asked about concrete design and construction practices.

To some, the answers will seem simple and obvious; others may prove to be extremely controversial.

All ACI members are invited to participate —either by submitting an inquiry, or even better, by telling JOURNAL *readers how an intriguing problem was solved. It may well be that readers will be able to suggest more practical solutions to inquiries than those presented.*

Q. What are the methods of bonding new concrete to old?

A. Proper bond of concrete, portland cement plaster or mortar, and toppings to concrete surfaces is important in producing durable structures. Lack of bond is often responsible for leakage at construction joints in hydraulic structures, for resulting unsightly incrustations, for failures of repairs to old structures, and for loosening of floor finishes from structural slabs.

Bonding of concrete to concrete falls into three general classifications: (1) bonding to preceding lifts of concrete (construction joints), (2) bonding to existing concrete (patches and floor topping), and (3) bonding of mortar coats and stucco to concrete surfaces.

The recommended practice in each type of job is essentially the same. Concrete surfaces which are to have concrete or mortar bonded to them should be rough, clean, and damp before placing the new material.

Bonding at construction joints

A construction joint occurs at any interruption of placing operations which is long enough to let the concrete stiffen so that new concrete cannot be incorporated integrally with that previously placed. Generally it marks the top of a lift, the end of a lift, or the end of a day's work.

The surface of the construction joint should be prepared in a manner that will insure bonding with the concrete later placed on it. If the joint must be watertight, the preparation of the joint must be particularly thorough.

It is not difficult to obtain a good joint where good quality low-slump concrete has been used at the top of the lift and has not been overworked. Wet mixes should be avoided. Their tendency to segregate and bleed badly results in weak concrete and a heavy layer of laitance at the surface which makes clean-up more difficult. If laitance is not removed, it is at these points that seepage and deterioration invariably first appear.

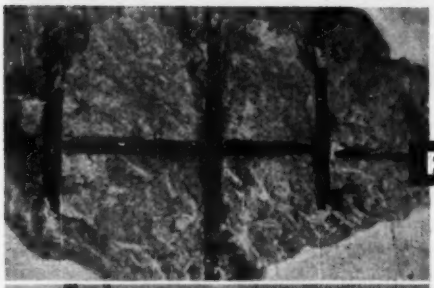
The quality of a joint depends on the quality of the concrete and on the clean-up of the joint surface.

The essential requirements in preparing the contact surface are that the old surface be clean and reasonably rough. Any of several clean-up methods, if executed properly, produce a satisfactory joint.

The surface of the concrete, while still soft (several hours after placing), can be swept with a stiff broom or scraped with a tool to remove laitance and roughened. The concrete should be hardened enough that the aggregate will not be loosened or the edges and corners of the concrete torn.

The so-called initial jet clean-up can also be used. The first step is the removal of all laitance and inferior surface concrete and the washing of mortar from protruding aggregate by a strong jet of air and water, at approximately 100 psi pressure. The operation must be performed after the concrete has stiffened but before it has become too hard for effective cutting—usually in from 4 to 12 hr after placement, depending upon rate of hardening. The concrete should be hardened sufficiently to prevent the jet from raveling the surface below the desired depth and from forming cloudy pools of water that will leave a film on the surface when they dry.

The surface of joints so treated should be especially well moist-cured, preferably by a 1- to 2-in. layer of saturated sand, and if possible the surfaces should never be permitted to dry out during the interval before concrete is placed on it. This sand layer also preserves the cleaned surface. In rare cases the surface has been kept free of contamination up to 48 hr by flushing with an



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air-water jet at 3- to 4-hr intervals. Before placing the new concrete the surface should be restored to the bright clean condition existing immediately following the initial jetting by vigorous brushing with fine wire hand brushes or by sandblasting as necessary. If the surface has been properly wet sand cured, little final scrubbing or sandblasting will be necessary.

However, this method of clean-up for surfaces to which concrete is to be bonded has lost favor on many of the larger jobs. The treated surface, if not specially protected, almost invariably becomes so contaminated before time to resume concreting that sandblasting is necessary to insure a satisfactory joint. The initial clean-up method including a comparable final clean-up usually costs more than one final sandblasting and washing operation and is not as foolproof. Initial clean-up is useful primarily where sandblasting is not required but where the joint surface must be free of laitance and loose or defective concrete. It may also be used on construction joints requiring sandblasting when the laitance and defective concrete are heavy—it is easier to remove the undesirable material before final set and complete the regular sandblast and washing treatment later.

Experience indicates that wet sandblasting and washing, immediately prior to placement of fresh concrete, is to be preferred where bond and watertightness are desired. Results of field and laboratory investigations indicate that this method of clean-up is effective in securing high bond strength. Deep cutting to expose pieces of coarse aggregate appears to be unnecessary. In fact, best results seem to be obtained where the degree of cutting is merely sufficient to cut away the surface film of cement paste exposing the particles of fine aggregate with possibly some coarse aggregate projecting.

Air tools may also be used to prepare the surface, but they tend to shatter the concrete and to make ragged edges.

Before placing the next lift of concrete, the surface should be free of loose particles and debris.

Continued on p. 26

Who's Who This Month

Bengt F. Friberg

"Combined Form and Reinforcement for Concrete Slabs," p. 697, was presented at ACI's 50th annual convention by Bengt F. Friberg, consulting engineer, St. Louis, Mo.

Mr. Friberg, an ACI member since 1928, has evolved several inventions for concrete construction, including the prestressing method, "Stress Curing," and "Cofar," a concrete floor construction system.

He received a degree in civil engineering from the Royal Institute of Technology, Stockholm, Sweden, in 1924, and after practicing structural engineering in Sweden, Mr. Friberg came to the United States in 1927 with the American Bridge Co. and later the Laclede Steel Co.

During World War II he served with the Corps of Engineers and in 1946 was appointed chief product engineer of the Granite City Steel Co. after which he became managing director, then vice-president and general manager for Granco Steel Products Co., a subsidiary of Granite City Steel Co.

Last year Mr. Friberg entered consulting engineering practice, specializing in steel and concrete structures, pavement design, prestressed concrete, and product consultation to the construction industry.

Jack R. Janney

"Nature of Bond in Pre-Tensioned Prestressed Concrete," p. 717, by Jack R. Janney, associate development engineer, Portland Cement Assn. Laboratories, Skokie, Ill., is an outgrowth of his presentation at the Centennial of Engineering held in Chicago, Ill., in 1952.

Mr. Janney has been conducting research at the PCA laboratories on structural reinforced concrete with emphasis on prestressed concrete since 1950. He received his BS degree in architectural engineering and his MS degree in structural engineering from the University of Colorado.

An ACI member since 1950, he is a member of ACI-ASCE Joint Committee 323, Prestressed Reinforced Concrete.

Orley O. Phillips

Orley O. Phillips, president, Phillips-Carter-Osborn, Inc., and vice-president, R. J. Tipton and Associates, Denver, Colo., presents "Practical Aspects of Plant-Produced Prestressed Concrete," p. 737.

Mr. Phillips, a civil engineering graduate of the University of Colorado, began his career in 1926 when he joined the Old Dominion Copper Co., Globe, Ariz., and the Miami Copper Co., Miami, Ariz., as a tracer and draftsman. From 1927-31 he was employed by the American Smelting and Refining Co. as draftsman, plant and construction engineer, and then as assistant project engineer. From 1932-37 Mr. Phillips was engaged as an engineer for the Buffalo Exploration and Mining Co.; City of Colorado Springs, Colo.; and Holly Sugar Co., Colorado Springs, Colo.

In 1937 he became a partner in the firm of Sanford and Phillips, consulting engineers, Colorado Springs, designing and supervising construction of structural steel and reinforced concrete structures. From 1940-44 he held various engineering supervisory positions.

Since becoming associated with R. J. Tipton in 1944 and forming the corporation of Phillips-Carter-Osborn, Inc., in 1949, he has had direct supervision of many projects. The work carried on by R. J. Tipton and Associates, Inc., has been in the field of water resources supply and development as it pertains to irrigation works and municipalities, involving numerous dams, pipelines, canals, water treatment plants, and hydraulic electric power. The work carried on by Phillips-Carter-Osborn, Inc., has consisted of structural engineering for buildings of all sizes as well as the field of sanitary engineering including sewerage and sewage disposal plants. Since 1949 he has been in charge of all operations of both corporations in the United States.

Mr. Phillips is president, Colorado Section of ASCE and president elect of the Professional Engineers of Colorado.

T. C. Powers

"Void Spacing as a Basis for Producing Air-Entrained Concrete," p. 741, was written by T. C. Powers, manager, Basic Research Section, Portland Cement Assn., Chicago, Ill.

Mr. Powers spent the first year and a half after graduation from Willamette University, Salem, Ore., in 1925, in the testing laboratory of the Oregon State Highway Commission. Following this he was in charge of concrete proportioning, inspection, and tests at the Bull Run Dam during 1927-28. The interval between the completion of the work at Bull Run Dam and June, 1930, was spent in the operation of a ready-mix concrete plant and studies of pozzolanic cements.

Since 1930 Mr. Powers has been a member of the staff of the Portland Cement Assn. advancing from associate engineer to assistant to director of research in 1934 and was appointed to his present position in 1940.

He has been an ACI member since 1927, twice a Wason Research Medalist, and is a frequent contributor to the JOURNAL. He is a member of ACI Committees 212, Admixtures, and 611, Inspection of Concrete.

A. T. Goldbeck

"Crushed Stone Production," p. 761, is described by A. T. Goldbeck, engineering director, National Crushed Stone Assn., Washington, D. C.

An ACI past president, Mr. Goldbeck has been active in Institute affairs since 1926—on the Board of Direction, administrative committees, and several technical committees.

Following graduation from the University of Pennsylvania, he served as an instructor at his alma mater and at Lafayette College. He joined the Office of Public Roads in 1910, became assistant engineer in charge of the Philadelphia Municipal Laboratory in 1913, and rejoined the reorganized Bureau of Public Roads and Rural Engineering in 1915. He served the Bureau successively as engineer of tests and chief of the Division of Tests. In these capacities he conducted and directed research on concrete pavement design and developed the Goldbeck soil pressure cell. Since 1925 he has been engineering director with the National Crushed Stone Assn.

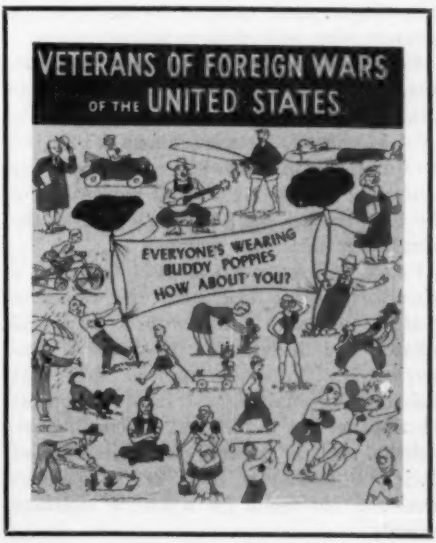
In January, 1951, the Highway Research Board of the National Research Council paid special tribute to Mr. Goldbeck by presenting him with the Highway Research Board Distinguished Service Award "in recognition of outstanding achievement in the field of highway research."

Rudolph C. Valore, Jr.

"Cellular Concretes," p. 773, is the first part of a paper by Rudolph C. Valore, Jr., materials engineer, Building Technology Division, National Bureau of Standards, Washington, D. C. The second and concluding part, will follow in June.

Mr. Valore has been employed by the National Bureau of Standards since 1938, and has been in the Structural Engineering Section of the Building Technology Division since 1948. He was a member of the Concreting Materials Section from 1939-48. Mr. Valore has engaged in research on dynamic testing and durability studies of concrete and other materials and on studies of lightweight concretes.

A graduate of North Dakota State Teachers College in 1936, Mr. Valore received an MA degree in education from New York University in 1938. He is a member of ACI and ASTM, and is a member of ACI Committee 213, Properties of Lightweight Aggregates and Lightweight Aggregate Concrete.



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ACAPA holds fourth annual convention

The fourth annual convention of the American Concrete Agricultural Pipe Assn. last February in San Francisco was highlighted by reports of definite progress in preparing a specification on low head concrete pressure pipe, as well as technical reports.

Prof. P. W. Manson, University of Minnesota, Minneapolis, Minn., in "Concrete Drain Tile in the Corn Belt," noted that in 1953 Minnesota installed about 20,000,000 ft of drain tile of which 80 to 90 percent was concrete. This is but a small percentage of the total needed, for 100,000,000 acres in the corn belt require some drainage.

Funds were provided in 1921 to create a laboratory at the University of Minnesota to study resistance of drain tile to acids and sulfates and recommend methods of improving it. Professor Manson said that probably the university's most important contribution was in the field of cement composition, such as showing the desirability of placing a maximum limit of 5.5 percent tricalcium aluminate for a sulfate resistant cement.

Six requisites were described in detail by Professor Manson for the manufacture of durable concrete drain tile: (1) well-graded, sound aggregate and sufficient cement, (2) maximum of mixing water while retaining a "dry" mix, (3) ample compaction of material, (4) adequate curing, (5) superior quality tile for acid soils, and (6) chemistry of the cement for sulfate exposure.

S. C. Fortier, district engineer, Delano-Earlimart Irrigation District, San Joaquin Valley, Calif., evaluated "Consumer's Report on Full Pressure Concrete Pipe Distribution System," which dealt principally with decisions in the selection of the system for the 56,000-acre Delano-Earlimart Irrigation District. The district chose an underground concrete pipe distribution system rather than open ditch or a combination of the two. The yearly cost would then be lowest because of less delivery loss, less maintenance, less interference to existing farms, no land loss, less public liability and consequent lower insurance, and no nuisance trash.

"Concrete pipe was adopted unanimously," Mr. Fortier said. It was chosen because of sustained high capacity, life expectancy, and large range of sizes available locally.

Officers for 1954 are A. M. Herman, Concrete Conduit Co., Colton, Calif., president; and H. B. Tellyer, Tellyer Concrete Pipe Co., Albuquerque, N. M., vice-president. Secretary G. F. Lillie, Fremont, Neb.; treasurer W. B. Freeman, Denver, Colo.; and directors G. D. Williamson, Yuba City, Calif., R. R. Reynolds, Exeter, Calif., and Earl H. Eby, Helena, Mont., were all re-elected.

ACPA holds 46th annual convention

Approximately 350 persons attended the 46th annual convention of the American Concrete Pipe Assn. in San Francisco last February.

A. W. G. Clark, president of B. C. Concrete Co., Ltd., Canada, was elected the association's president for 1954. Hugh P. Ford, Eugene Concrete Pipe and Products Co., Eugene, Ore., was elected vice-president with Harry W. Heath, Lock Joint Pipe Co., East Orange, N. J., and Carl A. Bluedorn, Zeidler Concrete Products Machinery Co., Waterloo, Iowa. David A. Decker, Mid-West Concrete Pipe Co., Franklin Park, Ill., secretary, and J. D. Mollendorf, Continental

Concrete Pipe Corp., Chicago, Ill., treasurer, were re-elected. Ivy H. Smith, Sherman Concrete Pipe Co., Jacksonville, Fla., outgoing president, was elected to the ACPA Board of Directors along with George B. Denham, Faulkner Concrete Pipe Co., Hattiesburg, Miss., and Henry C. Eames, New England Concrete Pipe Corp., Newton Upper Falls, Mass.

Five prominent civil engineers from the West Coast presented papers. A. M. Rawn, chief engineer and general manager of the County Sanitation Districts of Los Angeles County, Calif., spoke on "Manufacture and Construction of Large Diameter Pipelines and an Ocean Outfall," which described construction and installation of 7800 ft of 144-in. diameter reinforced concrete pipe in an open trench, and installation of a controlled sewage diffuser outlet on a 72-in. diameter ocean outfall.

Charles Gilman Hyde, sanitary and hydraulic engineer, Berkeley, Calif., presented "Improved Sewerage and Storm Drainage Works for the City of Watsonville, Calif."

Raymond E. Davis, director emeritus, Engineering Materials Laboratory, University of California, Berkeley, Calif, told of "Pozzolanic Materials—With Special Reference to Their Use in Concrete Pipe." Professor Davis described results of numerous tests conducted at the university and elsewhere on the effects of adding various pozzolanic materials to concrete mixes. Results seem to indicate that early strength of such concretes will be lower than normal, but that under moist conditions, some will be stronger than straight portland cement concretes after about six months. He also warned that concretes with pozzolanic materials will show great permeability at early ages but will be less permeable than many straight portland cement concretes after extended periods. He said that proper addition of the correct pozzolan would reduce leaching and improve the resistance of concrete to the action of aggressive "alkali" or "acid" waters.

A paper of considerable interest was delivered by Walter R. McLean, supervising civil engineer, East Bay Municipal Utility District, Oakland, Calif., on "Pozzolanic Materials and Their Use in Concrete Pipe and Structures of the East Bay Sewage Disposal Project." He discussed the findings of Professor Davis and how they were used in the design of concrete pipe and other concrete structures used in the $23,500,000 project in his district. He reported that infiltration on 18.28 miles of concrete pipe interceptors is only 14 percent of the allowable, saving at least $2400 per year on handling costs of water.

R. Robinson Rowe, bridge research engineer, State of California Department of Public Roads, described "The Role of Concrete Pipe in California's Expanded Highway Program." He estimated that California's need for concrete pipe would continue to increase as it has in the past few years. His experience indicates that the trend is toward longer lengths of pipe for culverts. He concluded by citing some unusual uses for concrete pipe, one of which was as forms for 609 voids formed in a hollow slab deck of a bridge. Three-foot sections of 24-in. unreinforced concrete pipe were used for this project.

Reviewers needed

Gradbeni Vestnik

This Yugoslavian technical periodical is now being received regularly at Institute headquarters. A volunteer reviewer is needed to keep Members informed of pertinent papers in this publication through the "Current Reviews" section of the JOURNAL. Those interested please write the Secretary.

The Reinforced Concrete Review

This English technical periodical is now being received regularly at Institute headquarters. A volunteer reviewer is needed to keep Members informed of pertinent papers in this publication through the "Current Reviews" section of the JOURNAL. Those interested please write the Secretary.

New Members

The Board of Direction approved 59 Individual applications, 1 Corporation, 14 Juniors, and 23 Students, making a total of 97 new members. Considering adjustments for nonpayment of dues, resignations, and deaths, the total membership for the month of March is 6460.

Individual

ADKINS, W. E., Montreal, Canada (Chf. Engr., Dominion Tar & Chemical Co.)

AMNEUS, THOMAS AXEL, Los Angeles, Calif. (Struct. Engr., Bridge & Struct. Design Div., Los Angeles)

ANDRUS, L. T., Omaha, Neb. (Struct., Bridges & Bldgs.)

ARCHIBALD, RAYMOND, San Francisco, Calif. (Division Engr., Bureau of Public Roads)

ARREOLA, MATIAS A., Cubao, Philippines (Prof. of Mathematics & Civil Engrg., Mapua Institute of Technology)

ASTOR, FRED C., North Miami Beach, Fla. (Pres., Electrofab Co.)

AYCOCK, MELL, Augusta, Ga. (Vice-Pres., Augusta Concrete Products Co.)

BATES, WILLIAM T., Honolulu, T. H. (Supv. Constr. Management Engr., Navy Dept., Bureau of Yards & Docks)

BLUMBERG, ABRAHAM, Brooklyn, N. Y. (Struct. Designer, Jacob Feld, Cons. Engr.)

BOGEHOLD, H. A., Edmonton, Alta., Canada (Engr., Engineering Enterprises Ltd.)

BOURGEOIS, CLAUDE, Montreal, Canada (Cons. Engr.)

BRATANOW, THEODORE D., Chicago, Ill. (Struct. Designer & Checker, Vern E. Alden Co.)

BRODERSON, G. E., Portsmouth, Ohio (Chf. Engr., Concrete, Res. Engr., Peter Kiewit Sons Co.)

BROWN, GEORGE J., Harvey, La. (Chf. Design Engr., J. Ray McDermott & Co., Inc.)

BUTLER, JACK D., Hato Rey, P. R. (Vice-Pres. & Gen. Mgr., Lock Joint Pipe Co., of Puerto Rico)

CLARK, ARTHUR M., New York, N. Y. (Asst. Chf. Design Engr., Custodis Construction Co., Inc.)

COMEAU, FAYE B., Richmond, Calif. (Struct. Designer, John J. Moore Co.)

DIAZ, RICARDO M. V., Manila, Philippines (C. E.)

DIONNE, HERMAN T., Chicago Heights, Ill. (C. E.)

DORSEY, FRANCIS J., Syracuse, N. Y. (Struct. Engr., PCA)

DOTZLER, GEORGE A., Miami, Fla. (Sr. C. E., Arthur V. Davis)

DRURY, FREDERICK W., Jr., Pasadena, Calif. (Chf. Engr., & Asst. Gen. Mgr., Airox Co.)

EAGLING, DONALD G., Flint, Mich. (Highway Engr.)

FREDEN, HARALD, Stockholm, Sweden (Director, Nya Asfalt Aktiebolaget)

FROHOCK, FRED C., Miami, Fla. (Engr., Paul Smith Constr. Co.)

GALBRAITH, FRANK, CEC, USN, Urbana, Ill. (N-ROTC unit, Univ. of Ill.)

GUNAJI, VASUDEO N., Belgaum, India (C. E., Gov't. of Bombay)

HANSON, NORMAN WALTER, Chicago, Ill. (Asst. Research Development Engr., PCA)

HARRY, WALTER CHARLES, New York, N. Y. (Struct. Designer, Lorimer & Rose)

HINTZ, EUGENE H., Albany, Calif. (Asst. Engr., State of Calif., Dept. of Pub. Wks.)

HUMEL, JAMES, Cleveland, Ohio (Pres., Humel Construction, Inc.)

HUTCHENS, HAROLD R., Kansas City, Mo. (Engrg.)

INGRAM, WILLIAM E., Jr., Denver, Colo. (Supv., D & H Contractors, Denver)

KEMPER, R. B., Los Angeles, Calif. (Mfr. of Concrete tunnel lining & construction equipment)

KENNEY, J. D., Jr., Houston, Texas (Engr., W. S. Bellows Constr. Corp.)

KUHN, OVERTON F., Denver, Colo. (Res. Engr. in Field, T. H. Buell & Co.)

LAZARIDES, T. O., Toronto, Canada (Cons. Engr. & Partner, T. O. Lazarides, Lount & Partners)

LENFESTEY, F. J., Green Bay, Wis. (Pres., F. Hurlbut Co.)

LITKA, RAYMOND, Milwaukee, Wis. (Struct. Engr., C. S. Whitney)

LORENZ, HANS, New York, N. Y. (Struct. Designer, Abbott, Merkt & Co.)

MALKANI, T. M., Calcutta, India (Chf. Engr., Calcutta Port Commissioners)

MCMORRIS, R. S., Glens Falls, N. Y. (Plant Mgr., Supv., Harder Silo Co. Inc.,)

MORGENTHALER, WALTER N., Woodbridge, N. J. (Design Engr., Praeger-Kavanagh, Engrs.)

NASH, D. F., Toronto, Canada (Salesman, Procter & Gamble Company of Canada, Ltd.)

NIGUIDULA, NESTOR N., Olongapo, P. I. (Supv., Public Wks. Dept., U. S. Naval Sta.)

PFANNKUCHE, H. C., Fort Worth, Texas (Field Struct. Engr., PCA)

RINGER, HERBERT P., Burbank, Calif. (Bldg. Dept. Supt., Burbank)

ROEDIGER, STANLEY I., Cleveland, Ohio (Gen. Contr.)

SCHUSTER, DONALD G., Green Bay, Wis. (Supt., Schuster Construction Co.)

SCOTT, JOHN A., Toronto, Canada (Jr. Engr., Gore & Storrie)

SNYDER, PAUL S., Pomona, Calif. (Sales & Service Mgr., Azusa Rock & Sand Co.)

SUTHERLAND, WILLIAM MORLEY, Auckland, N. Z. (Chf. Engr., Prestressed Concrete (N. Z.) Ltd.)

TANJUATCO, PEDRO C., Plaza Santa Cruz, Manila (Appraiser, Philippine Bank of Commerce)

TAYLOR, H. J., Austin, Minn. (Pres., Austin Ready-Mix Concrete Co.)

THOMSON, CARL W., Sacramento, Calif. (Bridge Engr., Field Constr., Res. Engr., Bridge Dept., Div. of Highways, State of Calif.)

WHITE, JACK DOUGLAS, Lakewood, Colo. (Struc. Design, Ketchum & Konkel, Cons. Engrs.)

WHITLOCK, JACOB O., Springfield, Ill. (Gen. Mgr. & Secretary, Midwest Prestressed Concrete Co.)

WYCOFF, RUSSELL, Kansas City, Mo. (Concrete Engr., Lehigh Portland Cement Co.)

YODER, CHARLES W., Milwaukee, Wis. (Owner, Charles W. Yoder, Cons. Engr.)

Corporation

PHILADELPHIA, CITY OF, DEPT. OF LICENSES & INSPECTIONS, BOARD OF BUILDING STANDARDS, Philadelphia, Pa. (Mr. David T. Anderson, Tech. Asst. to the Board)

Junior

BENTLEY, A. L., Jr., Perrysburg, Ohio (Engr., A. Bentley & Sons Co.)

BRUNGRABER, ROBERT J., Ithaca, N. Y. (Grad. Student, Cornell Univ.)

COLLETT, D. B., Bassendean, Western Australia (C. E., Public Works Dept., Perth, W. Australia)

DE CASTRO, JOSE MA., Ithaca, N. Y. (Grad. Student, Cornell Univ.)

DE COURTNEY, RAYMOND KERSHAW, Claremont, Western Australia, (B. Engr., Supv. Constr., Public Works Dept., Perth, W. Australia)

DIAZ, A. T. BOADA, Maracaibo, Venezuela, (C. E., Supv., Compania Shell de Venezuela)

JOHNSON, M. LYMAN, Lynchburg, Va., (Struct. Engr., Wiley & Wilson)

JOINER, GERALD V., Marietta, Ga. (Chf. Concrete Sub-Section, U. S. Corps. of Engrs., Mat. Testing Lab.)

KOURKENE, JACK P., New York, N. Y. (Prestressed Concrete Designer, Constr. Mfr., Field Insp. Res., Self-employed)

PANNELL, WILLIAM J., St. Louis, Mo. (Struct. Designer & Drafting, Wm. C. E. Becker)

REED, HERBERT, Spokane, Wash. (Asst. Engrg. Officer, Proc. Officer, Petty Cash Officer)

SCOTT, NORMAN L., St. Edward, Neb. (EIT, Missouri Pacific Railroad, St. Louis, Mo.)
SOUBRA, AFIF M., Denver, Colo. (USBR, Training & Visitors Sect.)
VILLEPELET, JACQUES E., Champaign, Ill. (Student, Univ. of Ill., Ingenieur des Ponts et Chaussees, France)

Student

BOWSER, HAMILTON V., Cambridge, Mass. (MIT)
CHAN, ROBERT H., San Francisco, Calif. (Univ. of Calif.)
CIPRIANO, SAM A., Lombard, Ill. (Univ. of Ill.)
GNOJEWSKI, LAWRENCE JOSEPH, St. Louis, Mo. (Univ. of Mo.)
HANNEN, WILLIAM, Chicago, Ill. (Univ. of Ill.)
HARDTKE, CHARLES F., JR., Barrington, Ill. (Univ. of Ill.)
HENDERSON, EARL WALLACE, JR., Springfield, Ill. (Univ. of Ill.)
HOWARD, LEONARD L., Columbia, Mo. (Univ. of Mo.)
KOCAL, RAYMOND J., Columbia, Mo. (Univ. of Mo.)
LAPATINSKAS, VYTAUTAS, Chicago, Ill. (Univ. of Ill.)
LIDDELL, JAMES WALTER, Chicago, Ill. (Univ. of Ill.)
MERRILL, CLAYTON, JR., Coloma, Mich. (Univ. of Ill.)
MILBRATZ, W. PETER, Toledo, Ohio (Univ. of Ill.)
NEWMAN, HARRY D., Chicago, Ill. (Univ. of Ill.)
SADEK, RAOUF, Heliopolis, Egypt (Cairo Univ.)
SAMMAN, WILLIAM D., Beirut, Lebanon (American Univ. of Beirut)
SCHOTTERER, ROBERT GOTTFRIED, Alameda, Calif. (Univ. of Calif.)
SMITH, RICHARD D., Chicago, Ill. (Univ. of Ill.)
SOTEDES, JOHN G., Chicago, Ill. (Univ. of Ill.)
STEED, HAROLD ROBERT, Chicago, Ill. (Univ. of Ill.)
STYLIANOPOULOS, LEO, W. Lafayette, Ind. (Purdue Univ.)
WOLD, ROBERT LEE, Glen Ellyn, Ill. (Univ. of Ill.)
ZARSE, LEIGH B., Milwaukee, Wis. (Univ. of Ill.)

Honor Roll

February 1—March 31, 1954

Raymond E. Davis leads the Honor Roll again this month with 17 credits. Lewis H. Tuthill holds second place with 8 credits, and Grant Bloodgood with 4 credits is in third place.

SHARE YOUR KNOWLEDGE. Let's do more in '54 to spread ACI to others and in turn glean information from them for ACI.

Raymond E. Davis	17
Lewis H. Tuthill	8
Grant Bloodgood	4
Herbert K. Cook	3
Earl I. Brown	2
Thomas Cholnoky	2
Elmo C. Higginson	2
Samuél Hobbs	2
John J. Hogan	2
J. W. Kelly	2
L. D. Long	2
James A. McCarthy	2
C. J. Posey	2
C. H. Scholer	2
J. W. Tinkler	2
Arthur G. Wood	2

Congress on precast concrete

The First International Congress of Precast Concrete, organized by the Chambre Syndicale Belge des Agglomérés de Ciment with the cooperation of the European Productivity Agency—Paris, Belgian Productivity Office, will be held in Brussels, Belgium, June 20-27. Founding of an international information office for precast concrete, presentation of technical papers, and inspection trips will be the main themes of the congress.

Papers will include "Shrinkage of Concrete Products," by R. L'Hermite and J. Chefdeville, Paris, France; "Quality Testing and Scientific Research in the Danish Precast Concrete Industry," by G. Hansen, Copenhagen, Denmark; "Shrinkage of Cellular Concrete," by R. Senouillet, France; "Cast or Reconstructed Stone, Including Carving and Sculpture," by J. F. Bradford, London, England; "Construction with Precast Concrete—Preparation," by H. J. Wolbeer, Zeist, Holland; "Construction with Precast Concrete—Execution," by C. Verruyt, Alphen a/d Rijn, Holland; "Some Economic Aspects of Use of Lightweight Concrete in the Building Trade. Utilization of Refuse from the Coal-Mining Industry in Manufacturing Concrete," by A. Jarrige, France; "Utilization of High-Grade Concrete in Cast Concrete Products," by C. Cesareni, C. Govia, A. Rio, and L. Santarelli and presented by G. Stellingwerff; "High-Grade Lightweight Concrete Manufactured in France," by R. LeLan, Paris; "Technology of High-Grade Concrete," by A. Hummel, Aachen, Germany; "Precast Concrete Construction in the United States," by A. Amirikian, Washington, D. C.; "Some Production Techniques in the American Precast Concrete Industry," by G. G. Olson, Phoenix, Ariz.; "Utilization of Air Entrainment in Precast Concrete," by J. B. Baroin, Paris; "Organization of Precast Concrete Works in Finland," by K. Tammilehto, Helsinki, Finland; "Advancement of the Precast Concrete Industry (Cements and Shrinkage)," by C. Joly, Belgium; "Concrete Masonry in the Swedish Building Trade," by B. Langton, Stockholm, Sweden; and "Principles and Development Trends in the Laying of Concrete and Reinforced Concrete Pipe Covered with Earth," by E. Marquardt, Stuttgart, Germany.

Problems and Practices

Continued from p. 19

The foregoing practices, although primarily applicable to mass concrete in such places as footings and dams, apply equally well to structural concrete. Structural concrete usually contains more water, has greater slump, and requires more working and vibration than does mass concrete because of more difficult placing conditions. Consequently, bleeding and coatings of laitance and inferior material at joint surfaces are more prevalent. Steel erection, form construction, and installation of reinforcement, piping, and conduits interfere with clean-up procedures and increase the time between lifts and the chances of contamination.

On this class of work it is seldom practicable to sandblast after forms for both sides are erected. As a result there is a greater interval between sandblasting and placing of the new concrete than in mass concrete work. On some projects the sandblasted surface is covered with damp sand. The sand, with sawdust and other debris, is then washed off with water, air, or an air-water jet just before placing the new concrete. (Loose nails, which tend to lodge against the forms and cause unsightly blemishes and rust stains, can be removed by magnetic devices.)

Formed construction joints are usually avoided wherever possible as they result in planes of weakness susceptible to the formation of cracks and to passage of water unless effective waterstops are provided. The surfaces of formed construction to which concrete is to be bonded should be sandblasted and washed before new concrete is placed.

Treatment of bonding surface

After a thorough cleaning, the bonding surface should be kept constantly wet for at least an hour before placing new concrete. On horizontal surfaces it is advisable to saturate the surface the day before new concrete is to be placed. Sufficient time should be allowed for surface wetness to disappear. The surface will then be damp but slightly absorptive.

In all cases the new concrete should be preceded by about ½ in. of soft mortar or neat cement grout. The mortar may be the same as that in the concrete with the coarse aggregate omitted, including the same quantity of air-entraining agent. The mortar should be soft enough to be readily spread on the joint surface. This soft consistency is usually possible well within the specified limit for the water-cement ratio. Overwet mortar tends to segregate and to run and flow into lower elevations. When accessible, the mortar should be scrubbed into the surface of the joint with wire brooms.

On inaccessible joints in structural concrete care must be taken to see that the mortar is distributed over the entire joint area. Air jets have been used to spread mortar in such places and air-suction guns have been found effective.

In column forms and deep narrow forms where ½ in. of mortar may seem inadequate, it is preferable to follow the mortar with several inches of concrete containing mortar in excess of that in the usual mix. In some cases it may be necessary to reduce the coarse aggregate in the first few batches to prevent honeycomb in the bottom of the layer. It is usually better to use batches containing coarse aggregate somewhat reduced in maximum size rather than use large quantities of straight mortar. Concrete should then be spread in thin layers and carefully spaded to prevent formation of stone pockets.

In placing against formed construction joints, the mortar should be scrubbed on the surface, or the surface sprayed with plastic mortar from an air-suction gun, immediately before concrete is placed against it. Particular care should be used to insure intimate contact between old and new concrete and to fill all irregularities by ample vibration close to the joint.

Tests indicate that when concrete is vibrated with high-frequency vibrators good bond is secured between successive layers. This is probably due to the re-mixing action which takes place under the action of vibration, thus preventing stone pockets from forming at the bottom of the layer. The bond may also be influenced by use of stiffer mixes made possible with vibration. Such mixes have less shrinkage and less tendency to form laitance than wetter mixes.

In bonding concrete or mortar to old concrete it is important to prevent the early drying of the new mortar or concrete, otherwise it has a tendency to shrink from the old surface. The new work should be kept

constantly moist for several days, and if practicable curing should continue a week or ten days.

At any construction joint, watertightness between the new and old concrete can be obtained only by complete contact and bond throughout the joint surface. A well-cleaned, roughened, moist joint surface; mortar coat; and thorough vibration of the new concrete throughout the area of contact are prime requisites.

The bond of new concrete to old in patching, stucco coats, and floor topping will be discussed in future issues of the JOURNAL.

Selected references

1. ACI Committee 318, "Building Code Requirements for Reinforced Concrete (ACI 318-51)"—Section 508, ACI JOURNAL, Apr. 1951, *Proc.* V. 47, p. 607.

2. ACI Committee 611, *ACI Manual of Concrete Inspection*, American Concrete Institute, 1941, pp. 54, 71-72, 76-77.

3. ACI Committee 614, "Recommended Practice for Measuring, Mixing, and Placing Concrete (ACI 614-12)," ACI JOURNAL, June 1945, *Proc.* V. 41, pp. 646-647.

4. "Bonding Concrete or Plaster to Concrete," *Publication* ST-11, Portland Cement Assn., Chicago, Ill.

5. *Concrete Manual*, U. S. Bureau of Reclamation, Denver, Colo., 1949, pp. 238-246, 264-265.

6a. Davis, Raymond E., and Davis, Harmer E., "Bonding of New Concrete to Old at Horizontal Construction Joints," ACI JOURNAL, May-June 1934, *Proc.* V. 30, pp. 422-436.

6b. Discussion, ACI JOURNAL, Jan.-Feb. 1935, *Proc.* V. 31, pp. 326-330.

7. "Equipment for Washing Down Concrete for Bonding New Concrete," ACI JOURNAL, June 1939, *Proc.* V. 35, pp. 587-588.

8. Gilkey, H. J., "Cement and Concrete," Section 7, *Civil Engineering Handbook* (Editor —L. C. Urquhart), McGraw-Hill Book Co., Inc., New York, N. Y., 1950, pp. 640, 645-646.

9. "How to Keep Horizontal Construction Joints Moist While Carpenters Are at Work," ACI JOURNAL, Feb. 1940, *Proc.* V. 36, pp. 409-412.

10. Joint Committee, "Recommended Practice and Standard Specifications for Concrete and Reinforced Concrete," American Concrete Institute, 1940, pp. 117, 123.

11. Judd, Samuel, "Bureau of Reclamation Practice in Design of Joints for Concrete Buildings," ACI JOURNAL, June 1943, *Proc.* V. 39, p. 558.

12. Kleinlogel, A., *Influences on Concrete*, Frederick Ungar Publishing Co., New York, N. Y., 1950, p. 37.

13. Rippon, C. S., "Construction Joint Clean-Up Method at Shasta Dam," ACI JOURNAL, Feb. 1944, *Proc.* V. 40, pp. 293-303.

14a. Wuerpel, C. E., "Tests of the Potential Durability of Horizontal Construction Joints," ACI JOURNAL, Jan. 1939, *Proc.* V. 35, pp. 181-188.

14b. Discussion, ACI JOURNAL, June 1939, *Proc.* V. 35, pp. 188-1—188-16.

50th anniversary of French concrete constructors

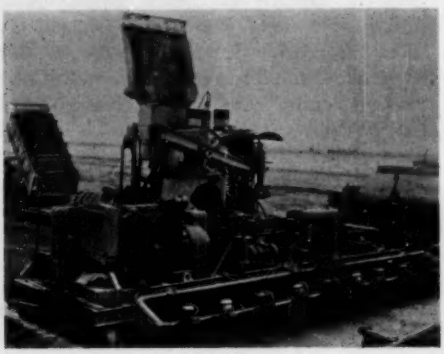
The Council of Reinforced Concrete Constructors of France and the French Union (Chambre Syndicale des Constructeurs en Ciment Armé de France et de L'Union Francaise), under the patronage of the Minister of Public Works, Transportation, and Tourism, and the Minister of Reconstruction and Housing, recently celebrated the 50th anniversary of that organization in Paris.

Included on the program was a special session honoring E. Freyssinet at which he was presented a medal. He spoke on the "Rise of Prestressed Concrete and Its Future."

The rest of the meeting was devoted mostly to the concrete field and included papers covering "General Study of Cracking," by L. P. Brice, vice-president, Commission d'Etudes Techniques de la Chambre Syndicale; "What Do We Know About the Failure of Concrete," by R. L'Hermite, director general, Laboratoires du Batiment et des Travaux Publics à Paris, and secretary general, Réunion Internationale des Laboratoires d'Essais de Matériaux; "Explanation of Objective of the European Committee on Concrete," by S. Boussiron, member, Fondateur et Doyen de la Chambre Syndicale; "Preparation of a Method of Calculation Based on Breaking (Failure) Conditions," by Y. Saillard, director, Services Techniques de la Chambre Syndicale, and secretary general, Comité Européen Beton; and "Tendencies in the Conception and Realization of Concrete Structures," by N. Esquillan, director, Technique des Enterprises Boussiron.

Tools, Materials, Services

Under this heading note will be made from time to time of producer literature of presumed technical interest (and available from its source for the asking) to ACI users of tools, equipment, materials, accessories, and special services.



Pavement vibration

To meet increasing emphasis on finish of concrete slabs imposed by Corps of Engineers specifications at the Davis-Monthan Air Force Base, Tucson, Ariz., contractors used a battery of ten Viber full-depth internal vibrators on a frame mounted back of the spreader in the construction of a 154,000-cu yd, 15 in. thick concrete parking apron which is 4000 ft long, 1000 ft wide at its broadest point, and 700 ft wide at the narrow point, and is designed to provide parking for heavy bombers with wheel loads of 100,000 lb. Electrically driven vibrators, with power supplied from two engine-driven generators also mounted on the spreader, are designed for operation at 10,000 rpm, and provide fast and thorough consolidation across the full width and to the full depth of the 15-in. slab.

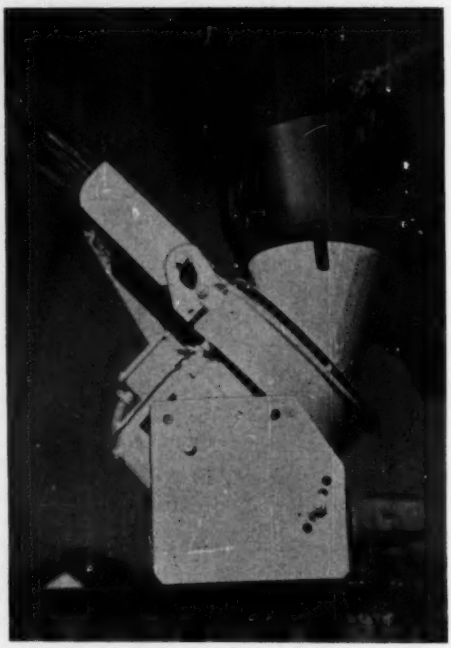
Corps of Engineers inspectors assigned to the project reported that one passage of the vibration battery assured a uniform consolidation of the concrete through the middle of the slab as well as along the form edges. This also speeded edge stripping of the 15 in., 25 ft wide lanes.—Viber Co., 726 Flower St., Burbank, Calif.

Water repellent compounds

A technical brochure entitled "Daracone Water Repellent Fulfills Silicone's Promises," describing the theory, applications, and benefits of special silicone-resin water-repellent compounds called Daracone for above grade-exterior masonry, is being offered by Dewey and Almy Chemical Co. Included are comparative ratings of various water repellents on the market today, including Daracone, and in addition to explanations of how silicones work, the brochure shows how such water repellents reduce maintenance costs and preserve structures. Job specifications are included for use of silicone water repellents to insure proper protection to the user.—Construction Specialties Division, Dewey and Almy Chemical Co., Cambridge 40, Mass.

Floor coating

Pennsylvania Salt Manufacturing Co., has announced the availability of NeoFloor which is said to be an economical and easily applied skid-proof surface coating for concrete, wood, and metal floors developed for use in plants, shops, and other places where oils, greases, and chemicals create safety hazards and maintenance problems. The manufacturer states this coating provides safe, comfortable footing and long-lasting surfaces which stand up under heavy traffic, heat-aging, and other rugged conditions, and it consists of a grit-like material anchored in a matrix of resilient neoprene bonded firmly to the floor with an adhesive primer. Both primer and coating are supplied in liquid form for easy, quick-drying application with brush or roller.—Corrosion Engineering Products Department, Pennsylvania Salt Manufacturing Co., Philadelphia 7, Pa.



Aggregate handling

Another sand and stone piling machine, the beltless Pettibone, has been added to the line carried by the Pettibone Mulliken Companies. Sand and stone discharged from belt conveyors are thrown into piles or bins at a minimum rate of 40 tons per hr by this machine with possible greater capacity, depending on the nature and condition of the material handled. The machine may be suspended under the discharge end of a conveyor, mounted on a platform, or if equipped with pneumatic tires on anti-friction bearing wheels, moved readily as the unit weighs only approximately 550 lb. The trajectory is regulated by an adjustable discharge chute and the receiving hopper will accommodate discharge from conveyor belts up to 30 in. wide.—Pettibone Mulliken Corp., 4700 W. Division St., Chicago 51, Ill.

Metallic aggregate for reducing concrete shrinkage

An eight-page booklet, "Vibro-Foil," has been released by the Horn Research Laboratories covering the properties, specifications, and uses of Vibro-Foil and some important suggestions on the preparation of foundations for heavy equipment.

Undesirable concrete shrinkage is said to be compensated for by this metallic aggregate, which is combined when manufactured, with a plasterizing material, a cement dispersing agent, and a catalyst. Suggested use of this product is in resurfacing concrete floors, concrete floor patching, bonding concrete surfaces, grouting under machinery, and tile grouting.—A. C. Horn Co., Inc., Long Island City 1, N. Y.

Nonaqueous liquid process for portland cement manufacture

Manufacture of portland cement by using a petroleum distillate, rather than water, as the suspending liquid has raised many questions which may now be answered on the basis of increased knowledge of equipment and operating costs of this method, according to J. C. Witte, consulting engineer, holder of U. S. Patent No. 2,611,714 which covers this process. Results have shown, according to Mr. Witte, that power requirements are less, cement is of a better quality, and clinker production is increased.

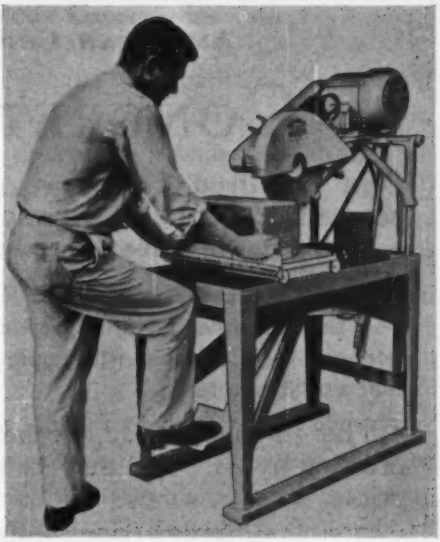
The nonaqueous liquid process is said to be applicable to conversion of existing dry-process or wet-process plants, or to the construction of new plants and may be applied in processing raw materials, clinker, or both. Raw materials, processing, equipment, costs, and results were the major items which raised questions regarding use of the nonaqueous liquid process. Additional data are now available.—J. C. Witte, 5834 Stony Island Ave., Chicago 37, Ill.

Bonding cement for brick and tile

The Ceilcote Co. announced recently the availability of Corobond, a synthetic resinous bonding cement for brick and tile. The new material is said to resist the corrosive effects of acids, alkalies, and solvents. Chief advantages claimed for the resin cement are superior workability and longer pot life which provides a greater working time prior to initial set, regardless of temperature.—William Smith, Jr., Ceilcote Co., 4894 Ridge Rd., Cleveland, Ohio.

Flexible joint seals for concrete pipe

A simple and effective way of securing tightly sealed, flexible joints in large-diameter concrete pipe lines under moderate pressures by using a newly developed Tylox rubber gasket, was demonstrated at the Graystone Concrete Products Co. plant, Seattle, Wash., recently in a series of tests observed by the City of Seattle Engineering Department. Featured in the tests were two sections of 84-in. Graystone pipe of specially engineered tongue-and-groove design, in combination with the newly developed rubber gasket. Tests were designed to simulate actual field conditions in determining the approximate maximum operating pressures under which an effective seal could be maintained, with the test section joint placed in various straight and canted positions. The test was conducted with a maximum 34-ft water head which exerted a force in excess of 75,000 lb on the end plugs.—Graystone Concrete Products Co., 134 Nickerson St., Seattle 9, Wash.



Concrete masonry saw

A new Di-Met masonry saw, developed by Felker Manufacturing Co., has been especially designed for use on masonry materials and operates either wet or dry using either diamond abrasive blades or ordinary abrasive cut-off wheels. It performs all types of operations such as step cutting, through cutting, skew cutting, and angle cutting.

An important feature claimed for the saw is the speed of adjustment which is made from the operating position. Rapid portability is said to be insured by almost instantaneous removal of the entire head and motor from the frame merely by loosening two pivot screws. The base is of welded-steel tubing construction, rigidly cross braced for maximum strength. It contains a coolant tray and a rolling table mounted on protected, replaceable steel tracks. An electric pump supplies coolant to the blade for wet cutting. Since it is direct-driven and totally independent from the blade power supply, no belts need be removed when dry cutting. Motor is 1½ hp and operates on both 110 and 220 volts. A selector switch permits instantaneous setting for correct line voltage.—Felker Manufacturing Co., 1128 Border Ave., Torrance, Calif.

Steel forms

"Blaw-Knox Steel Forms for Concrete Construction" is the title of a 50-page bulletin, No. 2430, recently released by Blaw-Knox Co. The booklet describes a wide variety of form types and uses with more than 50 photographs illustrating the range of application which includes aqueducts, arched and box conduits, tunnels, retaining and sea walls, tanks, caissons, shafts, dams, and bridge centering.

Included in the bulletin are practical design suggestions for economical adaptation of Blaw-Know steel forms as well as recommended data to be sent in with inquiries.—Blaw-Knox Co., Steel Forms Department, P. O. Box 1198, Pittsburgh 30, Pa.

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DISCUSSION

Discussion closed January 1, 1954

Sept. Jl. '53

Minimum Standard Requirements for Precast Concrete Floor Units—Committee 711

Concrete for Radiation Shielding—Edwin J. Callan

Absorption by Concrete of X-Rays and Gamma Rays—B. E. Foster

Effect of Sustained Overload on the Strength and Plastic Flow of Reinforced Concrete Beams—G. W. Washa and P. G. Fluck

Economical Design of Prestressed Concrete Beams—David P. Billington

Discussion closed February 1, 1954

Oct. Jl. '53

Proposed Recommended Practice for Selecting Proportions for Concrete—Committee 613

Development of a Cell for the Installation of Electrical Resistance Strain Gages—Herbert E. Worley and Richard C. Meyer

Failure of Concrete under Combined Tensile and Compressive Stresses—Gerald M. Smith

Correlation Between Laboratory Accelerated Freezing and Thawing and Weathering at Treat Island, Maine—Thomas B. Kennedy and Katharine Mather

Membership in the American Concrete Institute

To facilitate prospective members in joining the Institute, membership application forms are provided. Present Members may aid by bringing these forms to the attention of those who may profit from membership advantages. The grades of membership are described overleaf.

All who have an interest in concrete and a desire to improve it through a nonprofit educational service in gathering, correlating, and disseminating information on design, construction, manufacture, use, and maintenance of concrete structures and products are eligible for Institute membership.

There are many opportunities in the Institute for technical committee activity, contributions from your experience in technical papers and the briefer "Letters from Readers" section, and in reviewing technical literature. Thus you can help further ACI's aim "to provide a comradeship in finding the best ways to do concrete work of all kinds and in spreading that knowledge," and at the same time benefit from the experiences of other Members.

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Board of Direction, American Concrete Institute
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EXCERPTS FROM BYLAWS: ARTICLE I—MEMBERS

Section 1. This Institute shall consist of Members, Corporation Members, Contributing Members, Junior Members, Student Members and Honorary Members interested in furthering the Institute's objects as set forth in its Charter.

Sec. 2. A Member shall be an individual.

A Corporation Member shall be a firm, corporation, society, agency of government or other organization. A Corporation Member shall name one individual as its representative who will enjoy all membership rights and privileges.

A Contributing Member shall be an individual, firm, corporation, society, agency of government or other organization wishing to give larger support to Institute activities through the payment of larger dues. Contributing Members, other than individuals, shall name representatives as do Corporation Members.

A Junior Member shall be a person less than 28 years old.

A Student Member shall be less than 28 years old and a student in residence at a recognized technical or engineering school.

An Honorary Member shall be a person of eminence in the field of the Institute's interest, or one who has performed extraordinarily meritorious service to the Institute.

Sec. 3. All classes of Members except Honorary Members and Student Members, shall be proposed by at least one Member of the Institute and elected by a two-thirds vote of the Board of Direction. An Honorary Member shall be elected by unanimous vote of the Board of Direction. A Student Member shall be proposed by a member of his school's faculty, who need not be a Member of the Institute, and elected by a two-thirds vote of the Board of Direction.

Sec. 4. All Members shall have all rights and privileges of membership as determined by the Board of Direction except that a Junior or Student Member shall not vote nor hold office. The status of a Student Member shall change automatically to that of Junior Member on the first anniversay of his membership succeeding the date on which he ceases to be a student in residence. The status of a Junior Member shall be changed to that of Member on the first anniversary of his membership after he becomes 28 years of age.

Sec. 5. Applications for and resignations from Membership and requests for change of representatives of Corporation or Contributing Memberships shall be presented in writing to the Secretary-Treasurer. Resignations may be accepted only from Members whose dues are not more than 60 days in arrears, except by special action of the Board of Direction.

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